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cessors, or their relations to lower forms of life, or to their environment; nor is anything said regarding the mode of development of these animals. However, as a compact, concise, clearly written and useful manual of the morphology of vertebrates, it is well adapted for the use intended by the author, viz: "To present in as clear a form as possible the leading characters of vertebrate animals." As such we recommend its use in colleges and high schools, and to the general reader, though in these days the latter class of book buyers desire, as a rule, a book combining morphology and biology, with general views of the relation of animals to their surroundings, as well as their relations to fossil forms. It should, however, in justice be said, that all this could not be contained in a book of the size of the present one.

While we have no fault to find with the matters of detail, we would suggest that in the light of recent discoveries, it is old-fashioned and unphilosphical to regard the fourteen groups of carinate birds as "orders."

The wood-cuts are from well selected subjects, and are, with scarcely an exception, excellent, while the paper, press-work and binding render this little hand-book, like others of the series, both attractive and convenient.

FOSTER AND LANGLEY'S ELEMENTARY PRACTICAL PHYSIOLOGY.[1]—This well known book, so useful to students of anatomy, histology and physiology, has passed to a third edition, which differs from the preceding one chiefly by the introduction of a lesson on the structure of the ear, and by some additions to the lessons on the connective tissues. As it now stands the book is indispensable for medical students, and for biologists who have used Huxley and Martin's Biology and desire to extend their studies to histology and physiology. Its extensive use among naturalists is most desirable; to draw them away from "skin and bone" as well as systematic zoölogy, to a study of the living organism, and thus ultimately to the more general relations of animals to each other and their environment.

IHERING'S PERIPHERAL NERVE-SYSTEM OF VERTEBRATES.[2]—This elaborate essay treats of the following subjects: The peripheral system of nerves as regards the knowledge of the formation of regions in the vertebral column; the idea of segments in the vertebrates and invertebrates; a general phylogeny of the peripheral nerve-system and the formation of regions of the vertebral column. The chapters on these subjects are followed by a special account of these nerves in the different

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[1] *A Course of Elementary Practical Physiology.* By M. FOSTER, M.D., F.R.S.; assisted by J. N. Langley, B.A. Third edition. London, Macmillan & Co., 1878. 12mo, pp. 276.

[2] *Das Peripherische Nervensystem der wirbelthiere als Grundlage für die Kenntniss der Regionenbildung der Wirbelsäule.* Von HERMANN VON IHERING. Mit 5 tafeln und 36 holzschnitten. Leipzig, Verlag von F. C. W. Vogel, 1878. 4to, pp. 238.

classes of vertebrates. Regarding segmentation in vertebrates as compared with invertebrates, our author considers the body-segment of a vertebrate not as a single organ, but as the combination of a neuromere arising from the ectoderm with the scleromere and myomere arising from the mesoderm, which arise independently of each other and are not in any way to be taken together. Such an antithesis between the neuromere and the other organ-segments do not exist in the segments of the Articulates. Ihering also expresses the opinion that Semper's revival of the hypothesis of Geoffroy St. Hilaire and Treviranus is a matter rather of personal convictions than a subject for scientific discussion. This hits the nail on the head. He also shows that in vertebrates the new segments of vertebrates, in early life, are terminal; while the new segments of articulates are interpolated between the penultimate and terminal segments of the body. The law for articulates is not new to American students,[1] though only German and Swiss authorities are quoted in the present work.

THE PRINCIPAL CHARACTERS OF AMERICAN CRETACEOUS DINOSAURS.—Prof. Marsh, in the November number of the *American Journal of Science and Arts*, gives an account of the characters of several genera of saurians from the Rocky Mountain region. This paper gives us, for the first time, the characters of their ilium and the mode of its junction with the pubis and ischium, and the structure of the feet and of the axis vertebra, all points of great value to comparative anatomy and palæontology. He also extends to certain genera, characters of the skeleton which have been already determined in nearly allied forms. He proposes for them all a new division of the *Dinosauria* which he terms *Sauropoda*, with the following definition: (1.) Fore and hind limbs nearly equal in size. (2.) Carpal and tarsal bones distinct. (3.) Feet plantigrade, with five toes on each foot. (4.) The precaudal vertebræ contain large cavities apparently pneumatic. (5.) The neural arches are united to the centrum by suture. (6.) The sacral vertebræ do not exceed four, and each supports its own transverse process. (7.) The chevrons have free articular extremities. (8.) The pubes unite in front by ventral symphysis. (9.) The third trochanter is rudimentary or wanting. (10) The limb bones were without medullary cavities.

We remark, with reference to the above definition, that it embodies the characters of a well-marked division of reptiles, but that many of the characters given do not have such significance; or, in other words, do not possess the value which Prof. Marsh attaches to them. Thus, while some of them should be retained, Nos. 1, 4, 5, 7 and 10 must be rejected.

An important improvement over his previous essays is noticeable in this one, in that the author gives a definition for the only new genus proposed, viz: *Diplodocus*, which is, therefore, a real addi-

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[1] See Packard's Guide to the Study of Insects.